**ENGR 301/II**

**Tutorial 9 – *IRR & Other Analysis Techniques***

1. Consider two investment projects with the following cash flow transactions:

|  |  |  |
| --- | --- | --- |
| **n** | **Project 1** | **Project 2** |
| 0 | -$2000 | -$2000 |
| 1 | 0 | $1300 |
| 2 | 0 | $1500 |
| 3 | 0 | 0 |
| 4 | $3500 | 0 |

Compute the rate of return for each project.

1. The Imperial Chemical Company is considering purchasing a chemical analysis machine worth $13,000. Although the purchase of this machine will not produce any increase in sales revenues, it will result in a reduction of labour costs. In order to operate the machine properly, it must be calibrated each year. The machine has an expected life of 6 years, after which it will have no salvage value. The following table summarizes the annual savings in labour cost and the annual maintenance costs in calibration over 6 years:

|  |  |  |  |
| --- | --- | --- | --- |
| **Year (n)** | **Costs ($)** | **Savings ($)** | **Net Cash Flow ($)** |
| 0 | 13,000 |  | -13,000 |
| 1 | 2,300 | 6,000 | 3,700 |
| 2 | 2,300 | 7,000 | 4,700 |
| 3 | 2,300 | 9,000 | 6,700 |
| 4 | 2,300 | 9,000 | 6,700 |
| 5 | 2,300 | 9,000 | 6,700 |
| 6 | 2,300 | 9,000 | 6,700 |

1. Using benefit-cost ratio analysis, determine which one of the three mutually exclusive alternatives should be selected. Each alternative has a 6-year useful life, Assume 10% MARR.

|  |  |  |  |
| --- | --- | --- | --- |
|  | A | B | C |
| First Cost | $560 | $340 | $120 |
| Uniform Annual Benefit | $140 | $100 | $40 |
| Salvage Value | $40 | $0 | $0 |